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PART III. (HYMENOPTERA, SPHECIDAE)

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NEW SPECIES OF NORTH AMERICAN *AMMOPHILA*,
PART III.¹ (HYMENOPTERA, SPHECIDAE)²

By A. S. MENKE³

ABSTRACT: *Ammophila moenkopi* and *shoshone* are described from Arizona, and Wyoming and Utah, respectively. *Ammophila azteca* Cameron, new subspecies *clemente*, is described from San Clemente Island off the coast of southern California. These species belong in the *azteca* species group which is defined, and the included species are listed. New synonymy is given as follows: *azteca* Cameron, 1888 (= *pilosa* Fernald, 1934, *aculeata* Fernald, 1934), *peckhami* (Fernald), 1934 (= *willistoni* Fernald, 1934), *strenua* Cresson, 1865 (= *denningi* Murray, 1951), *varipes* Cresson, 1865 (= *comanche* Cameron, 1888).

Among material recently sent to me for identification by Mr. and Mrs. J. Davidson, Arizona State University, was a new species collected in north-east Arizona. This species, and another undescribed and related species from Wyoming and Utah are being described now so the names will be available to the Davidsons who are engaged in a study of *Ammophila* distribution in Arizona.

An undescribed subspecies of *Ammophila azteca* from one of the Channel Islands off the coast of southern California has been found in material sent to me by Dr. Fred S. Truxal of the Los Angeles County Museum of Natural History. This material was collected by the museum's Channel Island Biological Survey team in 1939. Additional specimens of this new subspecies were subsequently located in material on loan from Cornell University and the United States National Museum. I am describing this subspecies here because *azteca* is a close relative of the two new species. A more comprehensive treatment of these new taxa will be given when my revision is published.

Abbreviations used in citing type depositories are as follows: Arizona State University (ASU), Cornell University (CU), Los Angeles County Museum of Natural History (LACM), United States National Museum (USNM), University of California, Davis (UCD), California Academy of Sciences (CAS), and the Museum of Comparative Zoology, Harvard (MCZ).

The species described here belong to an assemblage I call the *azteca* group. All of the species in this group have a long preëpisternal sulcus; e.g., it

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extends well below the pronotal lobe and ends in the sternal region. In those species of the group in which the sculpture of the mesopleuron is obscured by appressed hair one must either scrape away the hair to see the sulcus, or study the hair carefully to see if a vertical line is discernible. With proper lighting and body angle this is easy to do after a little practice. The male genitalia are diagnostic in only a few species of this group. The aedeagi of the two species described here are similar to figures 12 and 14 in Menke (1964).

The species assigned to this group are: *acuta* (Fernald), *azteca* Cameron (= *pilosa* Fernald,⁴ *aculeata* Fernald⁴) *breviceps* Smith, *californica* Menke,⁴ New synonymy based on study of types.

evansi Menke, *harti* (Fernald), *karenae* Menke, *mediata* Cresson, *peckhami* (Fernald) (= *willistoni* Fernald⁴), *pruinosa* Cresson, *regina* Menke, *strenua* Cresson (= *denningi* Murray⁴) and *varipes* Cresson (= *comanche* Cameron⁴).

***Ammophila moenkopi* Menke, new species**

Figures 1 and 3

Holotype male: length 14 mm.

Color: Black; tegula and metapleural flange red; petiole tergite red laterally; gastral segments I-III red, tergite IV red laterobasally, sternite IV red; legs red except coxae, mid- and hindtrochanters and basal half of hind femur; wings clear, veins yellowish-red basally, brown apically.

Vestiture: Head and mesosoma (except propodeal enclosure) covered with long dense erect silver hair; frons, clypeus, and gena with dense appressed silver hair; pronotal collar and scutum sparsely covered with appressed silver hair (sculpture not obscured); pronotal lobe, thoracic pleura and propodeal side densely covered with appressed silver hair (sculpture obscured).

Structure: Labrum truncate but corners broadly rounded; clypeal surface broadly, evenly swollen, free margin arcuate in outline but with a broad, shallow median emargination; collar outline in lateral view as in Figure 3a; collar and scutum moderately macropunctate, interspaces shining although with microsculpture; scutellum sparsely punctate anteriorly, longitudinally ridged posteriorly; propodeal enclosure transversely ridged, interspaces not punctate; metapleural flange broadly lamellate, outer margin angulate, angle with a deep, narrow notch (Fig. 1); midtibia with one spur.

Female: Average length 15 mm, range: 11 to 18 mm.

Color: As in male except mandible red basally, clypeal margin frequently red, petiole sternite red, petiole tergite frequently all red, gaster red except for black spot on tergite V, legs red except for black coxae and sometimes black hind trochanter dorsally.

Vestiture: Same as male.

Structure: Labrum rounded, clypeal disk moderately bulging, very sparsely macropunctate, punctures confined mainly to lateral areas, median free



Figures 1-2. Metapleural flange—1, *Ammophila harti* and *moenkopi*; 2 a-c, *A. azteca*, showing variation of flange in this species. Figures 3-5. Lateral profile of the pronotum, a = male, b = female—3, *A. moenkopi*; 4, *A. harti*; 5, *A. shoshone*.

margin usually poorly defined because of weakly formed lateral tooth; inner orbits moderately converging below; collar outline as in Figure 3; midtibia usually with two spurs; mesosomal sculpture and other details as in male.

Types: Holotype male: 4.5 mi. E. Moenkopi, on *Poliomintha incana*, Coconino Co., Arizona, 14 June, 1966, J. M. Davidson and M. A. Cazier (ASU). Twenty-four male and sixty-nine female paratypes from the following Arizona localities: *Coconino Co.*: Moenkopi, 2 to 4.5 mi. E., 13-27 June, 1966, on *Poliomintha incana*, J. M. Davidson and M. A. Cazier (ASU, UCD, USNM, LACM, CAS, MCZ). *Navajo Co.*: Hotevilla, 7000', 28 June, 1966, on *Poliomintha incana*, J. M. Davidson and M. A. Cazier (ASU, UCD); Jadito Trading Post, 28 June, 1966, on *Poliomintha incana*, J. M. Davidson, and M. A. Cazier (ASU).

Discussion: In some males the petiole sternite shows some reddening ventrally and gastral sternite IV is sometimes black. The apex of the hind tibia is occasionally blackish in both sexes. Although the base of the hind femur is black, the extreme base is reddish in nearly all the specimens studied. Out of

twenty-four males only three had two midtibial spurs, and in two of these cases one leg had only one spur. Occasional females have one spur on one leg and one specimen had only one spur on both midtibiae.

Except for the red legs and extensively red abdomen this species is similar to *harti* (Fernald) which has black legs, and which incidentally, was collected with *moenkopi* at its type locality on the same date. The form of the collar is also different in the two species. In *harti* it is somewhat longer in lateral profile, and more arcuate. In *moenkopi* the lateral profile is in the form of a gradual slope from the transverse line to the top of the collar. Thus, the top of the collar is narrower (from front to back) in *moenkopi* than in *harti* (compare Figs. 3 and 4). The clypeus of female *moenkopi* differs from *harti* in having much sparser punctation and a slightly duller surface. In *harti* the clypeus is rather evenly, moderately macropunctate and the surface is strongly shining. Besides *moenkopi* and *harti* the only other species in the *azteca* group that have a lamellate metapleural flange are *shoshone* n.sp. and *azteca* Cameron. The red legs and yellowish red color of the veins at the wing base easily separate *moenkopi* from both of these however.

***Ammophila shoshone* Menke, new species**

Figure 5

Holotype male: Length 15.5 mm.

Color: Black; tegula pale posteriorly; media and cubitus of forewing reddish brown basally, veins elsewhere brown; petiole tergite and gastral tergite I red laterally below spiracle, gastral sternite I red.

Vestiture: Head and mesosoma (except propodeal enclosure) with dense erect silver hair; frons, clypeus, and pronotal lobe with dense appressed silver hair; mesopleuron sparsely covered with appressed silver hair (sculpture visible) but denser along mesopleural suture forming a narrow band from midcoxa to bottom of hypopimeral area; metapleuron and propodeal side sparsely covered with appressed silver hair (sculpture visible) but somewhat denser on inferior metapleural area near hindcoxa.

Structure: Labrum truncate but corner broadly rounded; clypeal surface broadly evenly swollen, free margin arcuate in outline but with a broad, shallow median emargination; collar outline in lateral view as in Figure 5a; collar and scutum moderately macropunctate, interspaces shining although with microsculpture; scutellum moderately punctate anteriorly, longitudinally ridged posteriorly; propodeal enclosure transversely ridged, interspaces not punctate; pleura and propodeal side moderately macropunctate, the punctures somewhat larger than on scutum; metapleural flange lamellate, angulate, the angle notched (similar to Fig. 1); midtibia with one spur.

Female: Average length 18 mm.

Color: Same as male except petiole tergite and gastral segment I red, II

red but tergite has an apical black spot (entirely red in Pilgrim Creek Camp female).

Vestiture: Essentially as in male except appressed silver hair of face sparser and sometimes lacking.

Structure: Clypeal disk moderately and evenly bulging, moderately macro-punctate except anteromedially where punctures are sparser, median free margin scarcely defined because lateral tooth is very obtuse or absent; inner orbits moderately converging below; collar outline as in Figure 5b; midtibia with two spurs; other details as in male.

Types: Holotype male: Horse Creek Camp, Shoshone National Forest, Wyoming 21 July, 1957, A. and H. Dietrich (CU). Nine male and four female paratypes with same data as type (CU, UCD, LACM) and one female from Pilgrim Creek Camp, Grand Teton National Park, Wyoming, 27 July, 1957, A. and H. Dietrich (CU), and one male from Utah Lake, Utah, 1 August, 1933, G. P. Engelhardt (CU).

Discussion: The only appreciable variation among the males is the almost complete lack of red on the abdomen in one male, the more extensive reddening of gastral tergite I (red extends above spiracle) in three others, the presence of a trace of appressed silver hair on the gena in some others, and the presence of two midtibial spurs in six of the males (only on one leg in three of these).

This species is very similar to *A. harti* in every respect except color, scarcity of appressed silver hair, and the form of the pronotal collar. In lateral profile the collar is shorter in *shoshone* than in *harti* (compare Figs. 4 and 5). This seemingly slight difference is supported by the almost entirely black color of male *shoshone*. Color is very variable in *harti*, as would be expected in a species which has a broad geographical distribution (Arizona to Alberta and east to Quebec and North Carolina), but I have not seen a single male of *harti* in which melanism has reached the state found in *shoshone* males. Even the blackest males of *harti* have gastral tergite I completely red. The identification of females of *shoshone* and *harti* will be difficult since the only reliable means of separation is by the form of the collar and/or association with males. I have not seen any *harti* from the areas in which *shoshone* occurs, and this fact suggests that the latter may eventually prove to be a synonym. The red color and collar shape differences may only be the result of environmental influences, but a decision on this depends on the collection and study of more material from various Rocky Mountain area localities. However, I have seen one male of *harti* from 10 mi. N. Flowell, Millard Co., Utah (UCD) which is south of Utah Lake, a *shoshone* locality. This specimen is typical *harti*.

Ammophila azteca and *moenkopi* are the only other members of the *azteca* group with a lamellate metapleural flange. *Ammophila moenkopi* is easily separated from *shoshone* by its red legs. The separation from *azteca* may prove more difficult. *Ammophila azteca* is one of the most wide ranging species of the genus in North America being found from coast to coast although only in the northern states east of the Rockies. Its range extends north-

ward beyond the Arctic Circle in the Yukon Territory, and into Labrador in the east. Over this range it displays a perplexing array of variation in both color and sculpture. Some of these varieties mimic *shoshone* fairly well and they occur in the same area. This situation makes it difficult to separate the two species unless one has a thorough knowledge of *azteca*. The wing veins of *azteca* are uniformly brownish black and the scutal and pleural sculpture is rougher. The scutal punctation in *azteca* is usually denser than in *shoshone* and the interspaces tend to form wrinkles. The mesosoma of *azteca* is shorter in comparison with *shoshone* because in the latter the propodeum is more elongate. The metapleural flange is variable in *azteca* and it is often only narrowly lamellate or not lamellate (Fig. 2a-c). *A. azteca* males usually have two midtibial spurs. The median lobe of the clypeus is well defined in *azteca* females because of a strong lateral tooth.

***Ammophila azteca clemente* Menke, new subspecies**

This insular population is distinguished from typical *azteca* by color and vestiture. There are no structural differences.

Diagnosis: Black except for faint reddish tints on the petiole tergite laterally and on gastral segments I-II ventrally; wings lightly infumate; erect hair of head and mesosoma dirty white tending towards brownish dorsally; appressed silver hair found only on clypeus and frons of male, pronotal lobe, mesopleuron at midcoxa, and at side of petiole socket; face of female with sparse appressed brown hair, but sometimes with a trace of silver.

Types: Holotype male, San Clemente Island, Los Angeles Co., California, 3 April, 1939, collected by Los Angeles County Museum Channel Islands Biological Survey team (LACM). Seven male and seven female paratypes, all from San Clemente Island: 3-4, April, 1939, L.A. Co. Mus. Channel Island Biol. Surv. (LACM, UCD); 8-12 April, 1923, collector unknown (CU, UCD); May, 1939, J. T. Scott (USNM).

Discussion: The high degree of melanism in *clemente* is quite striking and easily sets this subspecies apart from the normally bicolored mainland *azteca*. In typical *azteca* males the petiole tergite and gastral segment I are red except for a narrow dorsal black stripe on each (sometimes the gastral tergite is completely red). In western *azteca* males the second, and sometimes the third, gastral segment may be largely red also. Females of typical *azteca* have the same amount of abdominal red but usually lack dorsal black markings.

The erect hair of mainland *azteca* is silvery rather than dirty white or brown and often the appressed silver hair is more extensive than in *clemente*. Females, for example, nearly always have much appressed silver hair on the frons and clypeus.

The metapleural flange in *clemente* is moderately lamellate in all specimens studied (Fig. 2b). In typical *azteca* it varies from broadly lamellate to not lamellate (Figs. 2a-c).

Ammophila azteca occurs on at least one of the other Channel Islands. I have seen one male (LACM) from Santa Rosa Island and interestingly it has the typical mainland color pattern and the erect hair is silver.

LITERATURE CITED

Menke, A. S.

1964. New species of North American *Ammophila*. (Hymenoptera, Sphecidae). Acta Hymenopterologica, 2(1): 5-27. (for 1963)